

REMARKS

Claims 1-25 are pending in the subject application. Of those claims, claims 1-6 and 9-25 are rejected under 35 U.S.C. Section 103(a) as being unpatentable over U.S. Patent 5,972,424 to Draghi et al. (Draghi) in view of U.S. Patent 6,049,978 to Arnold (Arnold) and U.S. Patent 5,851,424 to Schaeffer et al. (Schaeffer). Similarly, claims 7-8 are rejected under 35 U.S.C. Section 103(a) as being unpatentable over Draghi in view of Arnold as applied to claims 1-6 and 9-25, and further in view of U.S. Patent 6,575,702 to Jackson (Jackson).

The foregoing rejections are respectfully disagreed with and are traversed below.

Independent claims 1, 19 and 25 are directed to a method for repairing a coated component, which has been exposed to engine operation, to restore coated dimensions of the component, comprising the recited sequential steps.

Applicant respectfully asserts that none of the cited references disclose or suggest such a method, including all of the sequential steps recited therein, whether viewed alone or in any combination. In particular, the primary reference, Draghi, is merely directed to the repair of a gas turbine engine component using a flash coating. According to Draghi, the part is inspected to “ensure that sufficient bond coat 12 remains to perform the repair ...” (Col. 4, lines 16-20). “If there is insufficient bond coat 12, the blade 18 may not be repaired with the method of [Draghi].” (Col. 4, lines 20-30).

In contrast, Applicant’s independent claims 1, 19 and 25 require “removing the thermal barrier coating system,” which includes a bond coat and a top ceramic coating, and applying a beta phase NiAl overlay coating to the substrate. Thus, the method of Draghi teaches away from the present claims and one skilled in the art seeking to develop such a repair process would not even be motivated to look to Draghi for guidance nor even combine it with any other reference.

The Patent Office asserts at page 3 of the Action that “the prior art method taught by Draghi requires applying a bond coat and build-up of thermal barrier coating material such that the total thickness of the repaired part (substrate plus coating layers) is restored to the pre-damage conditions as required by the claim.” Applicant respectfully fails to see where

Draghi teaches such a process and asserts that Draghi does not teach the restoration of coated dimensions as set forth in Applicant's present claims. Draghi merely teaches at col. 1, lines 57-65 that a thinner wall is acceptable as long as it meets applicable inspection criteria. Thus, a part may be inspected according to Draghi to ensure that it is not too thin. Draghi does not conduct any measurements or perform any calculations to rebuilt and restore overall component dimensions to those preceding an engine run to increase subsequent engine operation efficiency. Nor does Draghi even restore the coated dimensions of the component as required by all of Applicant's claims. Draghi merely applies a flash coating in an attempt to increase the number of times a part can be repaired.

Moreover, Draghi does not i) determine thickness of removed base metal substrate as set forth in Applicant's step b), ii) does not apply a beta phase NiAl overlay coating to the substrate and determine the difference in thickness between the beta phase NiAl overlay coating and previously removed bond coat as set forth in step c), and iii) does not reapply a top ceramic thermal barrier coating according to the equation set forth in Applicant's independent claims, wherein coated airfoil contour dimensions are restored to about the coated dimensions preceding an engine run.

The addition of Arnold, Schaeffer and/or Jackson does not cure the shortcomings of Draghi for at least the following reasons. Arnold is directed to a multi-step repair method where the dimensional differences between the pre-repaired dimensions of the turbine airfoil part and the desired post-repair dimensions of the turbine engine airfoil part are measured from at least one of the chordal and length dimensions of the airfoil part (Col. 8, lines 8-19). However, Arnold, alone or in combination with the cited references, does not disclose nor suggest Applicant's claimed sequential dimensional calculations and particular coating application and removal steps for restoring the dimensions of a coated component to about the coated dimensions preceding an engine run to increase subsequent engine operation efficiency.

Lastly, Schaeffer was cited as merely disclosing known NiAl bond coats and Jackson as teaching single crystal or directionally solidified alloys.

Applicant respectfully asserts that there is no teaching, suggestion or motivation that would lead one of ordinary skill in the art to combine and then modify the teachings of the cited

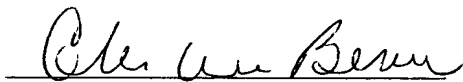
references in an attempt to arrive at the present claims. Without such a teaching or suggestion, the invention may only be considered obvious in hindsight, which is an improper basis for rejection.

For at least the reasons set forth above, independent claims 1, 19 and 25 should be found to be allowable. In that these independent claims are in condition for allowance, then claims 2-18 and 20-24 should also be found to be allowable in view of their dependence from an allowable independent claim.

All issues raised by the Examiner having been addressed, the subject patent application is believed to be in condition for immediate allowance. Accordingly, the Examiner is respectfully requested to reconsider and remove all of the outstanding rejections and to pass this patent application to issuance.

A call to the undersigned attorney at the telephone number listed below would be appreciated should the Examiner have any questions.

Respectfully submitted:



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10/8/04

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